

CLAIMS

1. A system for high-speed radiographic inspection of a fluid transport vessel, said system comprising:
 - (a) a radiation source and a radiation detector, said source being aligned with said detector longitudinally along an outside surface of said vessel, said source and said detector being positioned on opposite sides of said outside surface;
 - (b) first positioning means for moving said source and said detector longitudinally with respect to said vessel;
 - (c) second positioning means for moving said source and said detector circumferentially with respect to said vessel;
 - (d) a controller for controlling said first and said second positioning means; and
 - (e) a real-time imaging unit wherein said imaging unit receives image data signals from said detector.
2. The system of claim 1 further comprising a display means operatively associated with said imaging unit.
3. The system of claim 1 wherein said first positioning means comprises two guide rails disposed parallel to said vessel, and a carriage slidably mounted on said guide rails to enable said carriage to move longitudinally with respect to said vessel and wherein said second positioning means comprises roller means rotably mounted on said carrier, and a wheel resting on said roller means to enable said wheel to be turned circumferentially providing full azimuthal coverage with respect to said vessel.
4. The system of claim 3 wherein said wheel is a C-ring.
5. The system of claim 4 wherein said first positioning means is a transport vehicle and said second positioning means is an articulating C-arm.

6. The system of claim 1 wherein said source is an X-ray source and said detector is an X-ray detector.
7. The system of claim 6 further comprising CT means for converting said image data signals into corresponding three-dimensional CT images of said fluid transport vessel.
8. The system of claim 2 wherein said source is an X-ray source and said detector is an X-ray detector.
9. The system of claim 8 further comprising CT means for converting said image data signals into corresponding three-dimensional CT images of said fluid transport vessel.
10. The system of claim 3 wherein said source is an X-ray source and said detector is an X-ray detector.
11. The system of claim 10 further comprising CT means for converting said image data signals into corresponding three-dimensional CT images of said fluid transport vessel.
12. The system of claim 4 wherein said source is an X-ray source and said detector is an X-ray detector.
13. The system of claim 12 further comprising CT means for converting said image data signals into corresponding three-dimensional CT images of said fluid transport vessel.
14. The system of claim 5 wherein said source is an X-ray source and said detector is an X-ray detector.

15. The system of claim 14 further comprising CT means for converting said image data signals into corresponding three-dimensional CT images of said fluid transport vessel.
16. A method for high-speed radiographic inspection of a fluid transport vessel, said method comprising:
 - (a) providing a radiation source and a radiation detector, said source being aligned with said detector longitudinally along an outside surface of said vessel; and
 - (b) causing said source and said detector to move longitudinally with respect to said vessel while said source is illuminating an adjacent region of said vessel with radiation.
17. The method of claim 16 further comprising causing said source and said detector to move circumferentially around said vessel while said source is illuminating an adjacent region of said vessel with radiation.
18. The method of claim 16 further comprising:
 - (a) collecting image data signals from said detector; and
 - (b) displaying real-time two-dimensional images generated by processing said image data signals.
19. The method of claim 17 further comprising:
 - (a) collecting image data signals from said detector; and
 - (b) displaying real-time two-dimensional images generated by processing said image data signals.
20. The method of claim 17 further comprising:
 - (a) collecting image data signals from said detector; and

(b) displaying three-dimensional CT images generated by CT processing said image data signals.

21. The method of claim 17 further comprising causing said source and said detector to move in a coordinated manner so that one complete circumferential revolution of said source and said detector is completed in the time required for said detector to travel longitudinally a distance equal to the scanning width of said detector while said source is illuminating an adjacent region of said vessel with radiation.